

[Malthus redux]

Paul Kennedy (an eminent historian)

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Technology, demography, and the future of the world



It is now almost two hundred years ago since Dr. Thomas Malthus, one of Alexander von Humboldt's distinguished contemporaries, sat down to compose the most famous work on demography that has ever been written. That study, which was published in London in 1798 and is usually known as Malthus's first *Essay on Population*, focussed upon the swift-growing increases in the numbers of people living in Britain, France, and the neighboring states of northwest Europe at that time. For a number of reasons the infant mortality rates – which are usually high in pre-industrial societies – had been tumbling throughout the latter half of the eighteenth century, leading to a rapid increase in the numbers of young people.

To Malthus, who regarded it as inconceivable that food supplies could keep pace with a population, doubling every

25 years, a gloomy future beckoned for European societies; increasing malnutrition, "giant inevitable famine," social turbulence, wars, and widespread deaths caused by future diseases sweeping through a weakened populace, were just some of the consequences of peoples outstripping their surrounding resources.

In fact, although famine and death did afflict many societies (such as Ireland and Bengal) in the following century, Malthus's gloomy forecasts concerning his native Britain turned out to be wrong. Coristant emigration to the "new" worlds of America, Australia and elsewhere proved to be a vent for population pressures, and British agriculture, steadily increasing its efficiency, kept pace with food demand – at least until the mid-nineteenth century, when transoceanic food supplies became available. But the most important rea-

son why Malthus's predictions were wrong is that he failed to see the power of new technologies to alter human conditions. In fact, the steam-driven Industrial Revolution was to create such increases in productivity and trade and overall national *wealth* as to raise living-standards for decade after decade, alter social expectations, and steadily reduce the size of families. As Britons moved from the countryside to the towns, and gradually became richer, they went through the so-called "demographic transition" and population size stabilized. In short, technology had provided a solution to the challenge of over-population.

Why is it important to remind today's scientists, economists and other scholars of this historical case-study? It is because that, two hundred years after the appearance of Malthus's *Essay*, the world is once again witnessing a

population explosion, *not* in the richer, developed societies of Europe, Japan and North America, but in the poorer, resource-depleted lands of Central America, inland China, Africa, the Middle East, and South Asia. Once again the chief reason is a dramatic decrease in infant and child mortality rates in those countries, ironically as a consequence of introducing Western vaccination techniques.

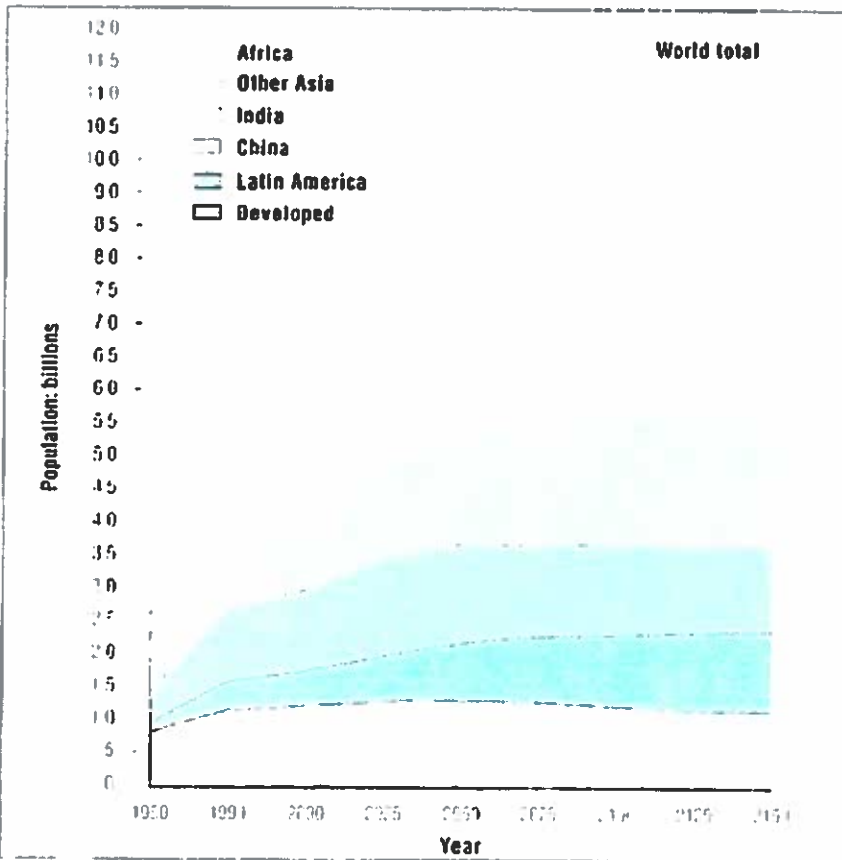
The numbers involved in today's demographic explosion are, however, much larger than those of Malthus's time, when the world's population had not yet reached the 1 billion mark. Now, with around 5.4 billion human beings inhabiting our planet and that number increasing by 90 to 95 million people every year, we are heading for a global population of 8.5 billion in 2025 and as many as 12 billion by the middle of the next century. China's



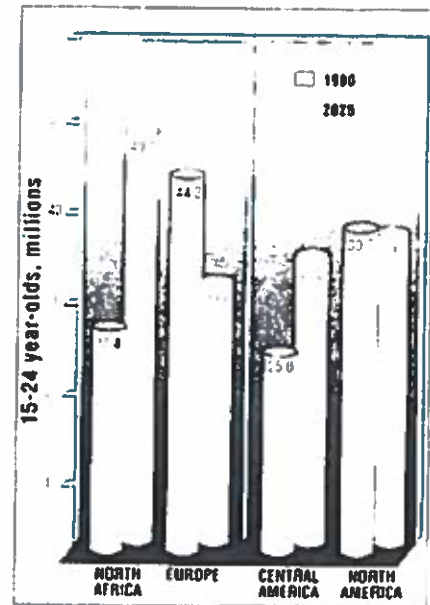
Thomas Robert Malthus (1766-1834)

population, which already (at 1.1 billion) outstrips its land and water resources, is projected to rise to 1.5 billion in 2025, exceeded only by India as the latter heads towards an eventual total of 2 billion. Africa, buckling under its existing 600 million inhabitants, has only the growing pandemic of AIDs to curb its forecast rise to 1.6 billion by 2025; and large rises are also expected in the populations of Indonesia, Bangladesh, Pakistan, Brazil, Mexico and Iran.

Within these countries, a giant internal migration will take place as peasants seeking jobs stream into shanty-cities of 20-25 million inhabitants with totally inadequate infrastructures and utilities. Finally, these will be demographically *adolescent* societies, with perhaps half of their populations under the age of 20 (or even, as in Kenya's case, under 16) – an ideal prescription for social and political turbulence should those masses of frustrated, energetic young people fail to gain education and employment. When Malthus's England confronted the challenge of its demographic explosion two hun-



Population projections by region (medium variant)
The medium variant is considered the most likely. Source: United Nations Population Division



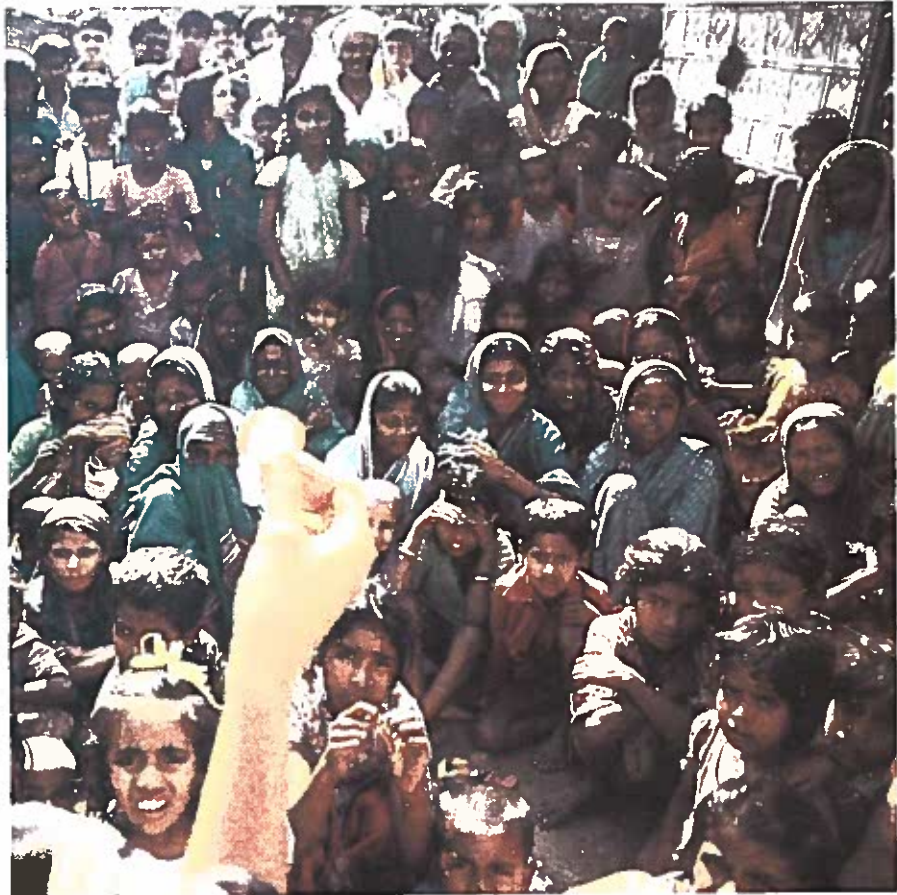
The pressure to migrate
Over the next 35 years the number of young people will increase dramatically in some regions, fall in others
Source: World Population Prospects, 1990, United Nations Population Division

dred years ago, that society at least possessed certain advantages: strong state structures, a fast-growing economy, large amounts of investment capital, numerous entrepreneurs, engineers and inventors, and a reasonably advanced infrastructure. Few if any of those strengths are evident in Bangladesh, Yemen or Mali today. On the contrary, there nowadays exists a dramatic global mismatch, since the capital and technology resources are chiefly located on one side of our planet, whereas the population explosion takes place on the other side.

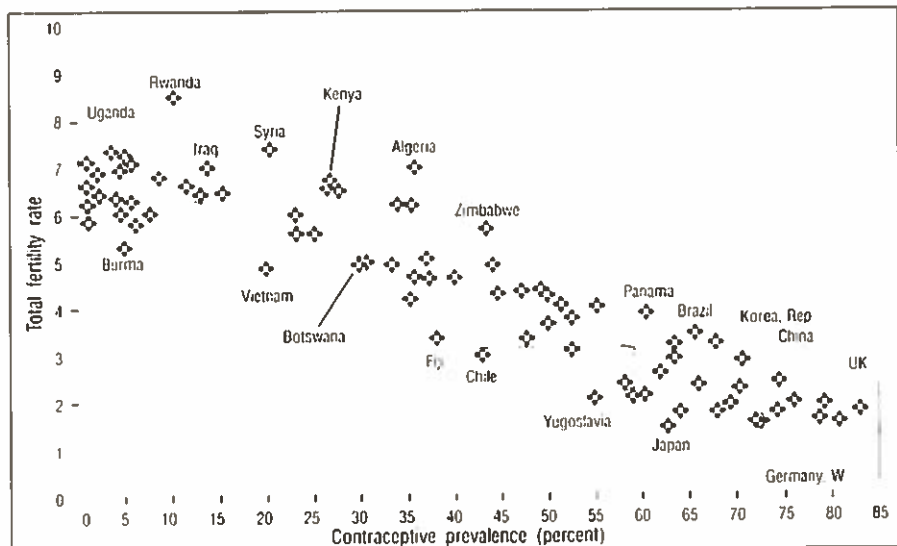
Why should this be of concern to the inhabitants of richer countries, beset by problems of their own? One might hope that the obvious first reply would be a humanitarian one, that these are our fellow global citizens who deserve help in their plight. Alas, idealism and social concern have rarely moved rich countries to rescue poorer peoples in the past, and the present plight of millions in Kashmir, Ethiopia, Haiti and elsewhere suggests that such neglect continues today.

But there are in fact three powerful *secular* reasons why we should take seriously these disturbing demographic trends and seek to lessen their impact. The first is the possibility that the collective economic activities of 5 to 8 billion people may indeed be creating a "greenhouse effect" of global warming as ever more trace gases pour into our atmosphere. It is no longer an issue of local environmental damage, serious though it is to witness the gross pollution of the Mediterranean and the disappearance of the Aral sea; the destruction of plant life species and wildlife habitats in Brazil; and the steady denuding of India (where the forest cover has shrunk from one-half to one-seventh in this century alone.) The eco-system itself could be at stake.

While the developed countries probably possess the capital and scientific resources to become environmentally "clean" by early next century, the atmospheric effects of such virtue are

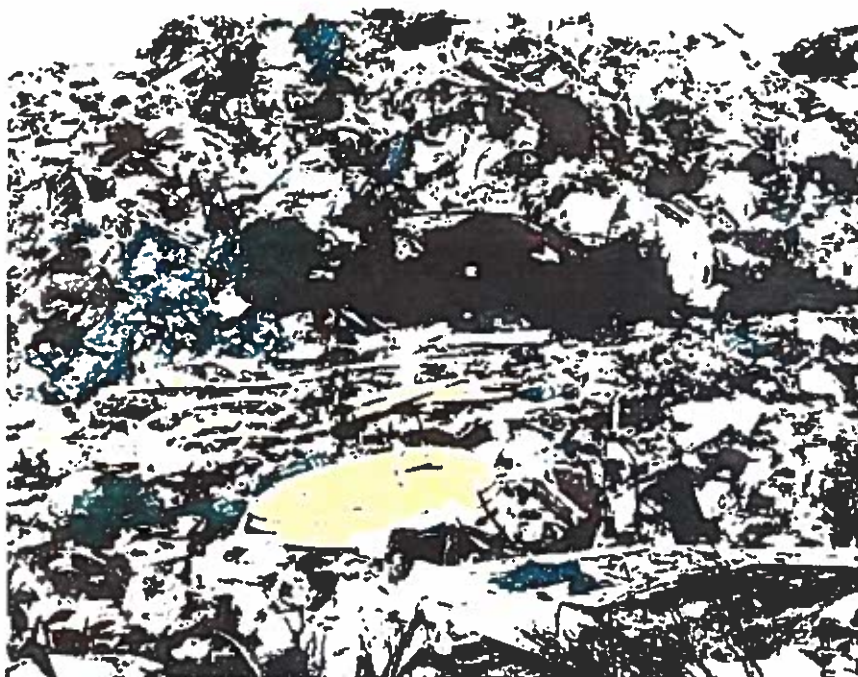


Everywhere on the Indian subcontinent, the population planners are on the move, distributing contraceptives. But people cannot be forced to use them.

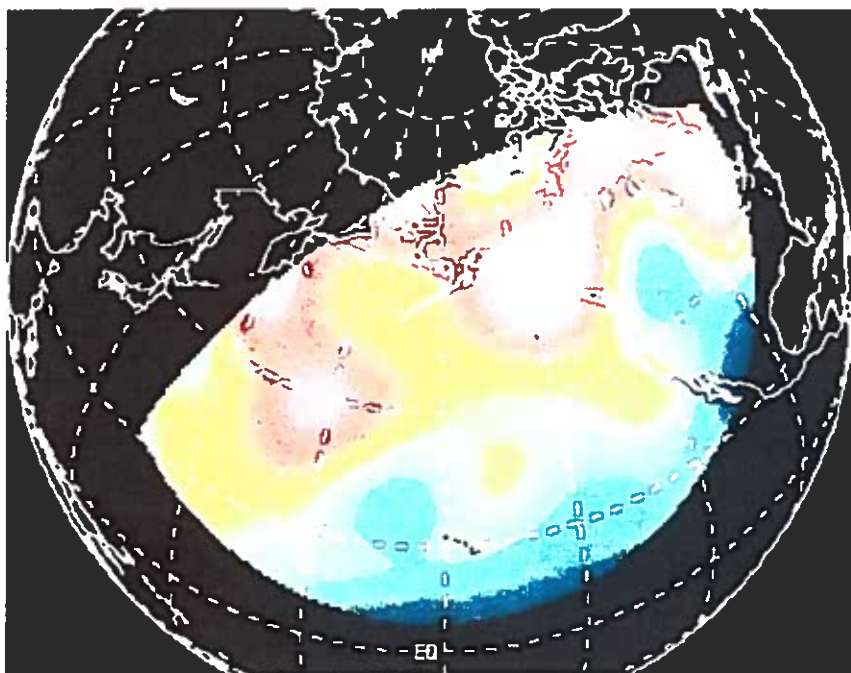


Use of contraceptives and fertility in general: The axes on the left lower section of the illustration indicate the total fertility rate of 3.3 and the contraceptive prevalence of 59% which constitute the preconditions for realization of the United Nations' "medium-term" prognosis in the year 2000.

Source: United Nations



More people are producing more waste.
How much can the environment take?



More people are producing more trace gases.
How much can the ozone layer take?

likely to be eclipsed by the continued increase in pollutants from China, India, Mexico, and other fast-industrializing countries now unable to afford sophisticated emission controls. If we are concerned about the varied consequences of global warming, rises in sea levels, increased heat stress and greater weather instabilities, we need to devise technologies to assist poorer nations to reduce emissions in the first place. Equally serious could be the prospect of further surges in large-scale illegal migration from stress-ridden, over-populated societies to richer, demographically-stagnant regions in the north. Even now millions and millions are being held in ramps or are en route from central America, Africa, south Asia and the Middle East to the United States, Germany, Australia and other favored destinations – this movements being stimulated (ironically) by a communications revolution which displays, globally, television programs like *Dallas* and *Brideshead Revisited*.

Already, the Spanish and Italian navies are on daily patrol to check the flow of illegal immigrants; but as Africa's population threatens to treble while Europe's stagnates, ought we not to expect much more of this in the future? And how far will the robotics revolution coming out of Japan – where automated factories are assembling products more efficiently and cheaply than plants employing low-cost labor in south-east Asia – steadily undermine the task of creating 40–50 million new jobs world-wide each year to ensure employment for fast-growing youth?

If the latter cannot get jobs in the developing world, or if the rich countries' slide towards protectionism undercuts poorer nations' chances of paying their way in the world through exports, should we really be surprised if masses of people head north to find employment? Are European nations, already showing signs of xenophobia at the relatively small percentage of immigrants in their midst, capable of becoming real multi-cultural societies? If not, will the racial tensions worsen?

Finally, there is the consideration that not all of these troubled states are like Ethiopia: weak, and unlikely to threaten us in the future. The same explosive combination of fast-growing populations, frustrated youth, depletion of land and water resources and so on occurs also in parts of the world – Algeria, Egypt, Jordan, the Euphrates valley, south-west Asia – where fundamentalist, antiwestern movements or ambitious regimes exist; where territorial disputes are long-standing; and towards which vast numbers of sophisticated, mass-destruction weapons continue to be exported. If nothing else moves us, here is an old-fashioned “national security” threat to cause us to consider ameliorating conditions in those regions.

How can technology – that is, human ingenuity and inventiveness – be harnessed to help solve our global problems? As we noted earlier, nineteenth-century England avoided the fate Malthus had forecast for it because it adopted the newer inventions of the Industrial Revolution. Can we in our turn harness today’s emerging technologies – overwhelmingly in possession of the rich societies – to treat the challenge of a world adding to its numbers by 95 million beings each year?

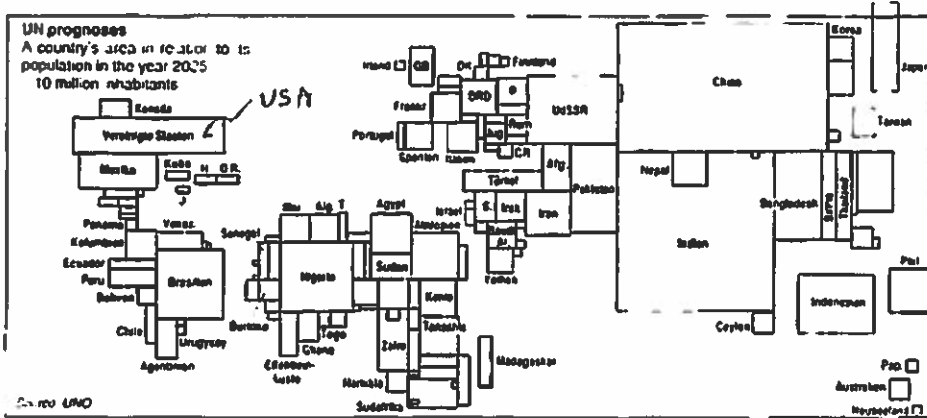
Technology is not, of course, a *Deus ex machina*, completely independent of the social circumstances in which it is created and applied. Political and cultural conditions are also of critical importance. To improve our planet, clearly, a great deal depends upon the peoples and leaders of developing nations themselves. European and American assistance can hardly be expected to produce improvements in countries where corrupt and obstructive regimes prevail; ethnic and religious rivalries dominate politics; deeply-held animist or fundamentalist religions impair any changes in the status and education of women (and thus also impair the prospects of reducing average family size); and faulty economic policies smother growth. On the other hand, we ought to be ready to offer a package of policies and technolo-



Some 20% of the world's population consumes 80% of the world's energy. This cannot go on. Can energy production be increased without limitation?



More automobiles, more roads, more oil consumption and more exhaust gases – can new technologies do anything to change this?



Population statistics: race against the unknown

gies to reform-minded, developing countries which plead for our cooperation and aid.

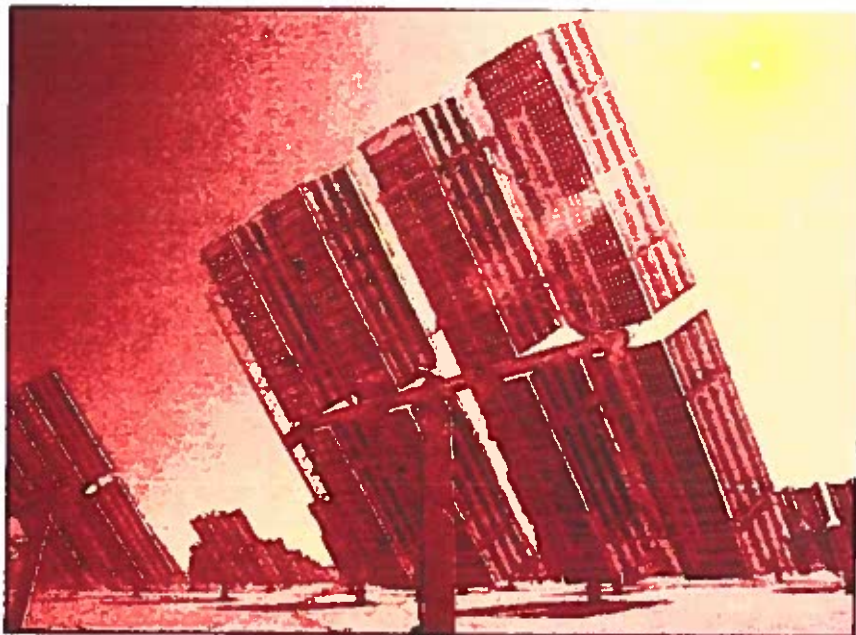
In just the same way, changes are also required among the leaders and peoples of the developed world. We need politicians imaginative and bold enough to rise from their short-term and local problems, and to articulate to their electorates the need to pay attention to these larger global issues. Similarly, we need a media less focussed upon sensations and gossips, and willing to devote more space and time to international concerns. There ought to be a move by the rich countries to increase the amount of development monies to at least the internationally agreed-upon target of 0.7 per cent of GDP annually; and to ensuring that such aid goes to environmentally-sound and sustainable projects in cooperation with local communities, and not to the clumsy "giganticist" schemes of the 1960s (steel mills, huge dams, etc.). We should be willing to support the tens of thousands of engineers and scientists now released from Cold War-related research to use their talents to produce solutions to our global problems.

The technologies involved in addressing our planet's ills need not be as dramatic and transcending as the steam-engine in Malthus's time - although it is hard to estimate the benefits that would flow from a significant break-

through in the field of solar energy, that is, achieving such a drop in the unit cost of sun-powered energy that it could be made available cheaply to the peoples of Asia and Africa, weaning them from their reliance upon wood, oil, coal and other fossil fuels. But technology could also include the development of small "solar ovens" to cook a village's daily meals, or transferring the fruits of breakthroughs in bio-tech agriculture (disease-resistant and heat-resistant crops) without requiring large patent and user fees from

poor nations. Finally, medical technology could make further advances in the creation of safe and inexpensive contraceptives for the hundreds in the creation of safe and inexpensive contraceptives for the hundreds of millions of women in developing countries who desire to stabilize family size.

None of these technologies, even taken together, *guarantees* that we will head off global disaster, though they offer some prospect of repairing at least part of our planet's troubled condition. What they point to, however, is the larger point of our message about "Technology, demography, and the future of the world": that, faced with these swift-growing population and environmental pressures, and the possibilities of consequent and political turbulence in various regions of the world, we desperately need the talents of scholars and scientists of all disciplines to focus upon providing solutions. The endless possibilities of human ingenuity, first fully proclaimed in that era of the Enlightenment which both Humboldt and Malthus inhabited, have to be called upon once again if we are to have any hope of dealing with our global challenges.



Solar energy - endlessly available but still very limited in usability. Many people regard it as a magic carpet to the future.